SCREW HOLDER

The invention relates to a screw holder defined in the preamble of claim 1.

In order to minimally damage the soft parts around the bone when surgically implanting an implant screwed into the bone or the joint, the surgery should be carried out on the bone or also illustratively on a vertebra without uncovering large areas of the parts to be treated (minimally invasive technique). But clamping tongs used to insert bone or pedicle screws are no longer suitable when the opening of the soft parts is minimal.

The objective of the invention is palliation. Its purpose is to so configure a screw holder that it shall be able to turn in or out a bone or pedicle screw being held in place by the implement used to turn the screw in and out.

The invention solves this problem by means of a screw holder evincing the features of claim 1.

In a preferred embodiment, the screw holder of the invention consists of a longitudinal shank fitted at its end with affixing means allowing to affix the screw holder in a motor-driven screwdriver or also being simply handled manually. A spindle is present at the other end of the cylindrical shaft and has a cross-section such that this spindle is insertable into the aperture in the screwhead receiving an implement to turn the screw in and out. Moreover a spring is mounted on the spindle to allow clamping the screw and to remove the screw holder spindle from the screwhead aperture after this screw was turned in or out.

In relation to the screwhead aperture receiving the implement turning the screw in or out, the screw holder spindle may assume various cross-sectional shapes, for instance that of a hexagonal socket.

As regards the preferred embodiment of the screw holder of the invention, the above spindle is of approximately polygonal cross-section, the polygon corners being rounded and the sides being concave.

The spring may be a leaf spring or another elastic element, however in a preferred embodiment of the screw holder of the invention and on account of the said spindle's small diameter, it may be a simple spring wire less than 2 mm, which optionally may be bent.

The spring may be inserted into a groove for the elastic part with an adjoining borehole to hold the spring. The part of the spring serving as a retention means also may be bonded, soldered or clamped into the groove. The screw holder of the invention may be implemented in various designs using a spring inserted into a groove. This groove may be present in an edge of the cross-sectionally polygonal spindle or it may be present in a lateral spindle surface running parallel to the longitudinal axis.

The dependent claims state further advantageous embodiments of the invention.

Essentially the advantages of the invention are that thanks to the screw holder of the invention, the screw to be turned in or out can be clamped to the screw holder while simultaneously being turned in or out.

The invention and its developments are elucidated below by several embodiments shown in the partly schematic drawings.

Fig. 1 is a sideview of an embodiment of the device of the invention;

Fig. 2 is a front view of an embodiment of the device of the invention;

Fig. 3 is a partial section of the embodiment of the device of the invention shown in Fig. 2;

Fig. 4 is a front view of a further embodiment of the device of the invention; and

Fig. 5 is a partial section of the embodiment of the device of the invention shown in Fig. 4.

The embodiment of the screw holder 7 of the invention shown in Fig. 1 comprises a cylindrical shank 1 having a central axis 5, a rear end 2 and a front end 21. An affixation means 13 is configured concentrically with the central axis 5 at the rear end 2, allowing to affix the screw holder 7 in a motor-driven screwdriver (omitted) or also in a manual grip. A spindle 4 also concentric with the central axis 5 is present at the front end 21. The diameter of the spindle 4 is less than that of the cylindrical shank 1 of the screw holder 7 and as a result the front end 21 of the cylindrical shank 1 forms a shoulder 3. As shown in Figs. 2 and 4, the spindle 4 has a cross-section 8 configured in such manner that the spindle 4 is insertable into the aperture 14 in the screwhead 16 in the implement used to turn in and out the screw 15.

Figs. 2 and 3 show an enlargement of the spindle 4 comprising a front end 6 and a rear end 12 adjoining the shoulder 3. The spring 9 also is shown enlarged. The cross-section 8 of the spindle 4 is approximately polygonal, though the corners 10 are rounded and hence rounded edges 20 running parallel to the central axis 5 are produced. Moreover the side surfaces 11 of the spindle 4 running parallel to the central axis 5 are concave with respect to the central axis 5. A groove 17 is present along one of the concave side surfaces 11 and runs parallel to the central axis 5. A borehole 18 in the spindle is flush with the groove 17 and runs parallel to the central axis 5, and receives the spring 9 pressed into it, as a result of which the clamped part 22 of the spring 9 is located inside the borehole 18 whereas the bent part 23 of the spring 9 runs in the groove 17. The bent part 23 of the spring 9 projects across the side surface 11 of the spindle 4 transversely to the central axis 5 and as a result a screw 15 -- of which the aperture 14 to receive an implement turning the screw 15 in or out is slipped over the spindle -- is clamped by the spring 9 against the spindle 4.

The embodiment shown in Figs. 4 and 5 of the screw holder 7 of the invention only differs from the embodiment shown in Figs. 2 and 3 in that the groove 19 as well as the borehole 18 flush with it is present along an edge 20 of the spindle 4.

CLAIMS

1. A screw holder comprising a longitudinal shank (1) having a central axis (5), a rear end (2) and a front end (21) and a spindle (4) adjoining the front end (21) comprising a front end (6) and a rear end (12), the spindle (4) being of approximately polygonal cross-section (8),
characterized in that
an elastic element (24) is inserted in such manner into the spindle (4) that, in its unstressed state, it projects transversely to the central axis (5) across the cross-section (8) and therefore a screw (15), of which the screwhead (16) comprises means (14) receiving the spindle (4), shall be clamped by the elastic deformation exerted by the elastic element (24) transversely to the central axis (5).

2. Screw holder as claimed in claim 1, characterized in that the elastic element (24) is a longitudinal spring (9).

3. Screw holder as claimed in claim 2, characterized in that the spring (9) runs parallel to the central axis (5) and can bend elastically to-and-fro perpendicularly to the central axis (5).

4. Device as claimed in one of claims 1 through 3, characterized in that the spindle (4) is cylindrical and in that the approximately polygonal cross-section (8) has rounded corners (10) and concave faces (11).

5. Device as claimed in one of claims 1 through 4, characterized in that the spring (9) is inserted in a groove (19) at one of the edges (20) of the spindle (4) that run parallel to the central axis (5).

6. Device as claimed in one of claims 1 through 4, characterized in that the spring (9) is inserted in a groove (17) at a spindle (4) side surface (11) running parallel to the central axis (5).

ABSTRACT

A screw holder comprising a longitudinal shank (1) having a central axis (5), a rear end (2) and a front end (21) and a spindle (4) adjoining the front end (21) and having a front end (6) and a rear end (12), the cross-section (8) of the spindle being approximately polygonal. An elastic element (24) is inserted in such manner into the spindle (4) that it projects across the cross-section (8) and that as a result a screw (15) of which the screwhead (16) comprises means (14) receiving the spindle (4) can be clamped.

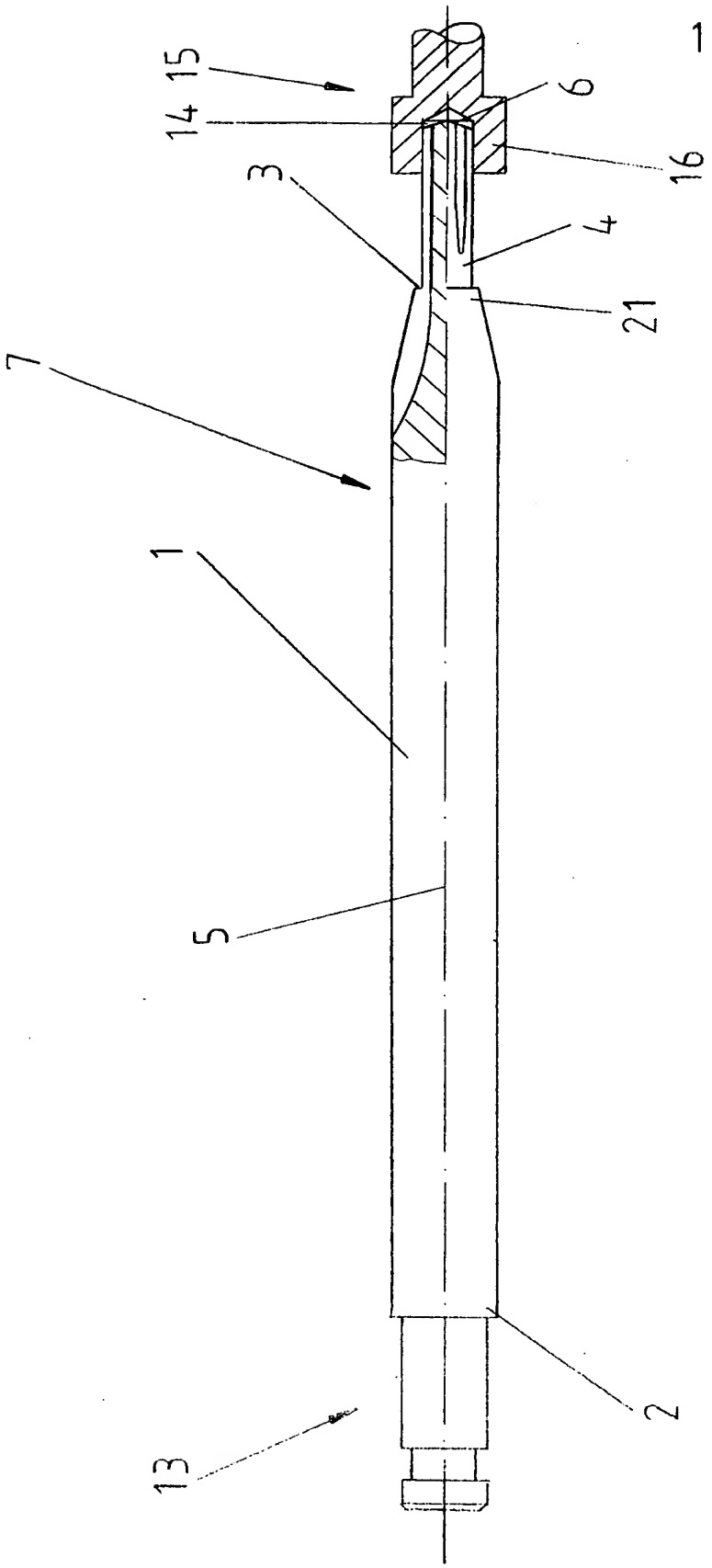

Fig.1

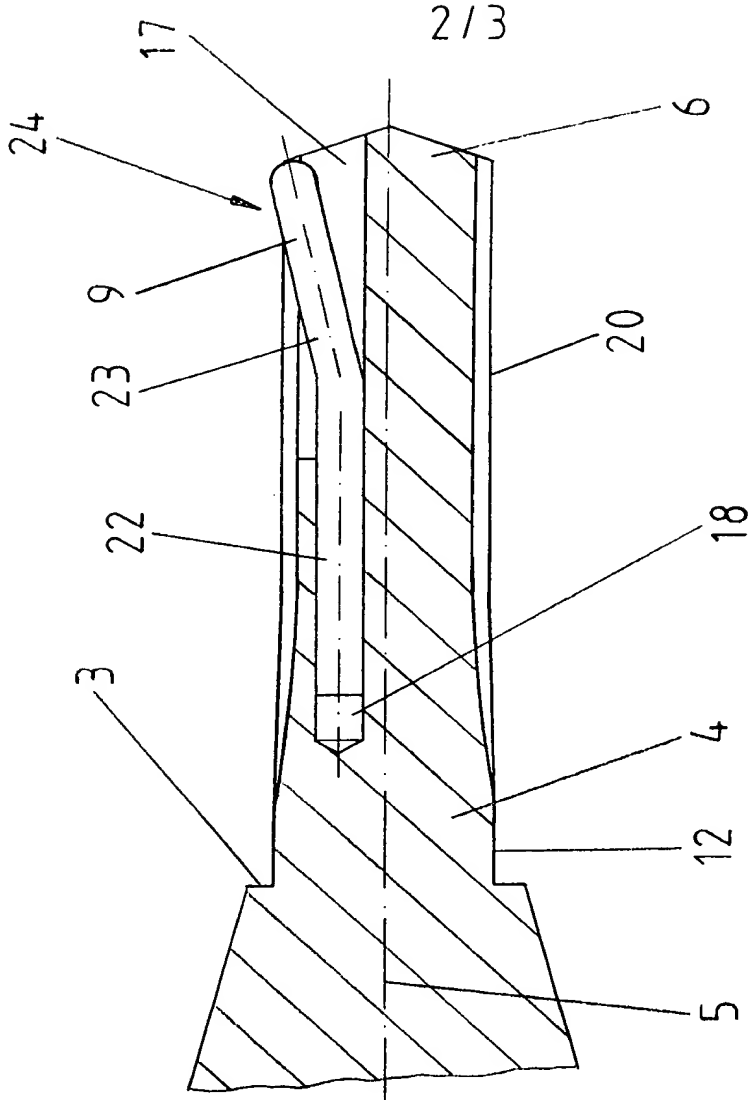

Fig. 3

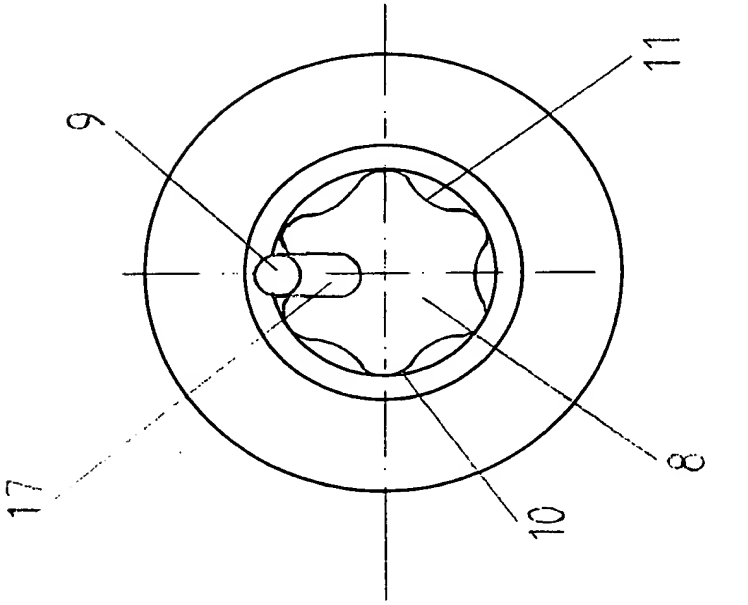

Fig. 2

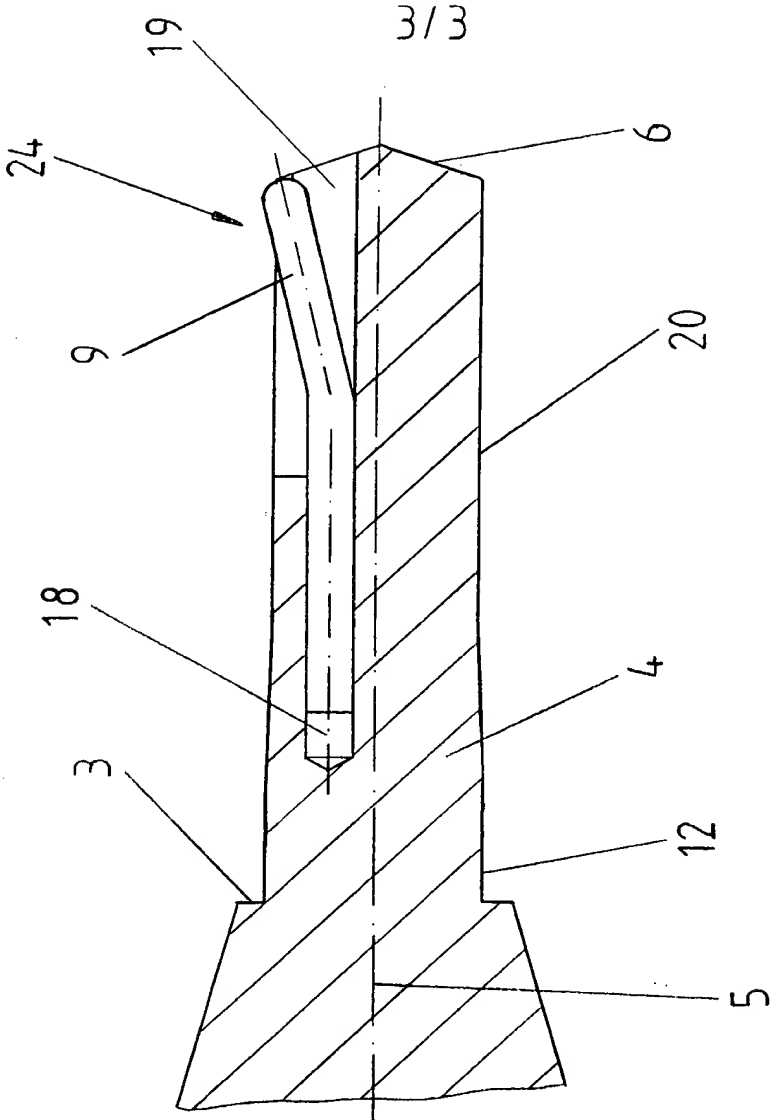

Fig. 5

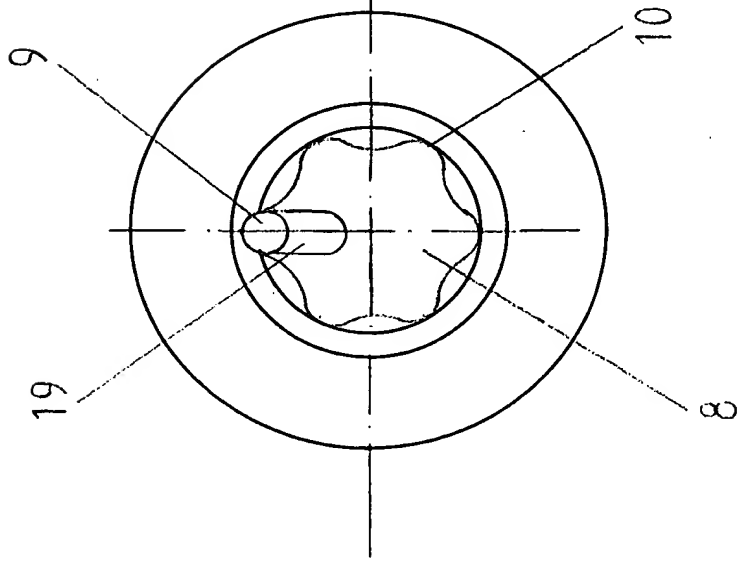

Fig. 4